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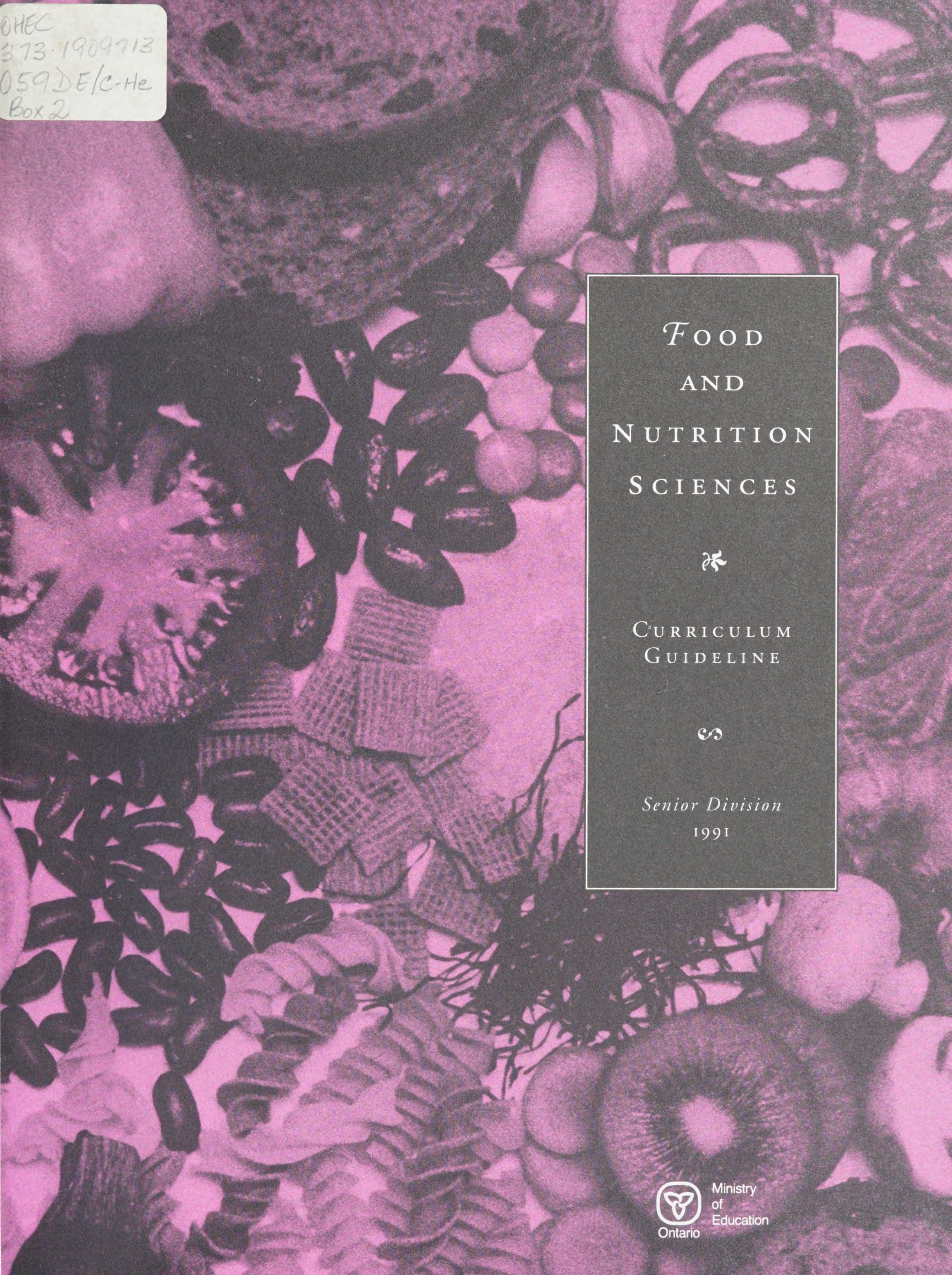

FOOD AND NUTRITION SCIENCES

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CURRICULUM GUIDELINE

* * *

Senior Division
1991

Ministry of Education
Ontario

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PREFACE

This document supersedes and replaces *Dietary Supervisors, RP-52, 1966.* It provides the basis on which school boards shall review, plan, and implement food and nutrition sciences programs.

This document reflects the developments and ongoing changes in food and nutrition, including the effects of technological developments on the food industry. It is also consistent with the policies outlined in the circular *Ontario Schools, Intermediate and Senior Divisions (Grades 7-12/OACs): Program and Diploma Requirements, 1989,* revised edition.

Food and Nutrition Sciences, 1991 provides the guidelines and authorization for two Senior Division courses to be offered at the basic, general, and advanced levels of difficulty. These courses will be classified as Senior social science credits.

FOOD AND NUTRITION SCIENCES COURSE CODES

Common course codes consist of five characters. The first three characters of food and nutrition sciences course codes are as follows:

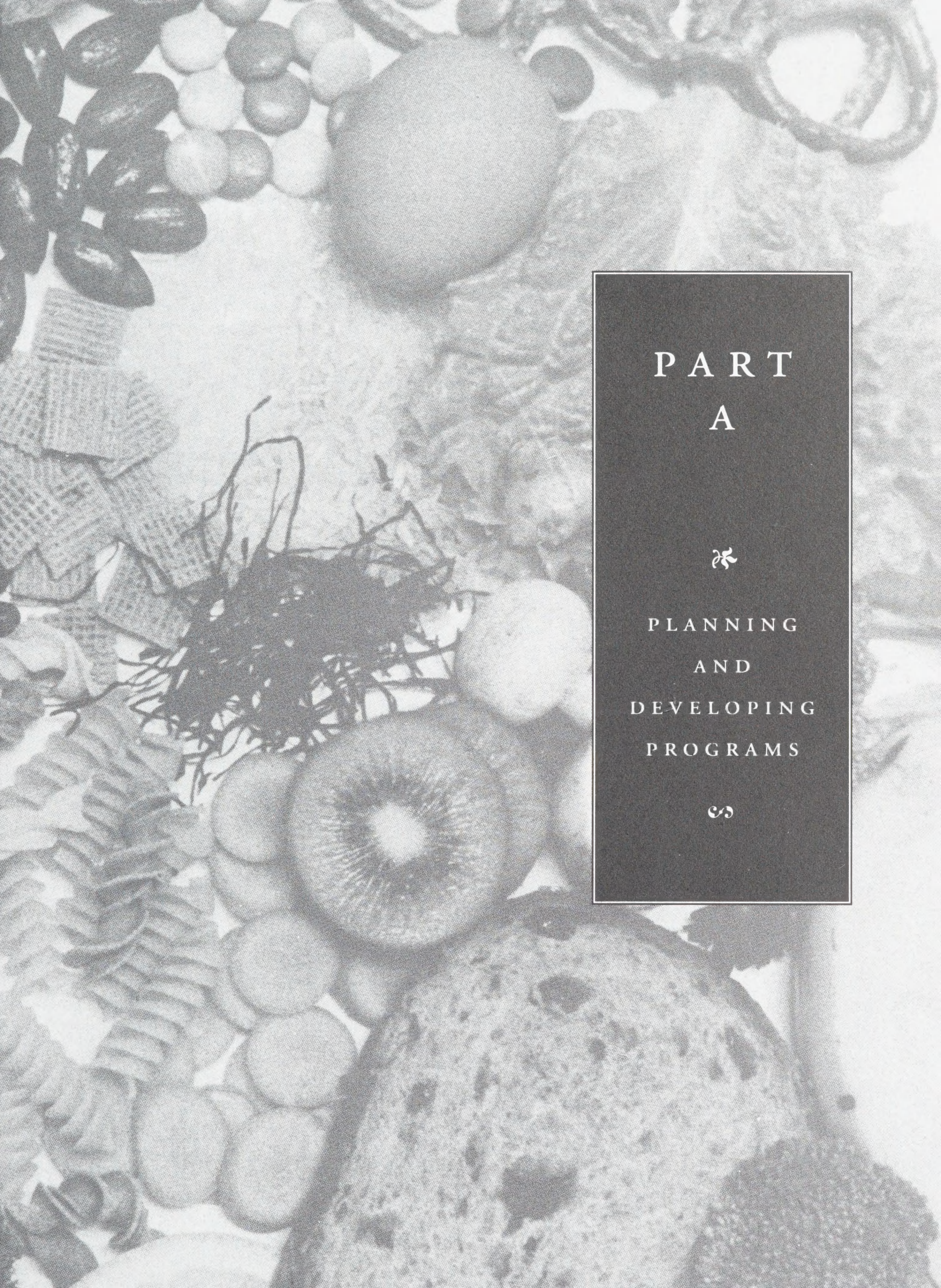
Food and Nutrition Sciences I (NZN)
Food and Nutrition Sciences II (NZS)

The fourth character will indicate the grade at which the course is offered:

3 = Grade 11
4 = Grade 12

The fifth character will indicate the level of difficulty:

B = Basic
G = General
A = Advanced



PART A

PLANNING AND DEVELOPING PROGRAMS

1. INTRODUCTION

1.1

RATIONALE FOR FOOD AND NUTRITION SCIENCES COURSES

Individuals require knowledge about nutrition and food in order to increase their well-being by making appropriate choices about what to eat. However, people make choices about what to eat not only on the basis of their knowledge about nutrition and the wise use of food but also according to their value system, their religion, their lifestyle, their ethnocultural background, and their economic circumstances.

The study of food and nutrition is best done, therefore, in a multifaceted way. An examination of various principles, theories, facts, and attitudes based on culture, politics, religion, technology, science, sociology, geography, and economics can help students understand themselves, their food patterns, and the food choices available to them. Students should also become aware of the broad range of nutritional issues that affect and will continue to affect their dietary patterns.

In order to encourage students to make healthy nutritional choices and to enable them to understand the complex psychological and social dimensions of food, the courses developed from this guideline must provide students with opportunities to examine, analyse, compare, and evaluate the various options that are available to them. These courses must also focus on the decision-making skills involved in making food choices and must provide students with (a) a framework within which they may make appropriate dietary choices for the maintenance of their health and well-being; (b) a broad range of activities involving food; and (c) opportunities for experimentation to test the scientific principles related to food.

Courses developed from this guideline should also provide students with information about careers in food and nutrition sciences. Advanced level courses must prepare students for postsecondary studies in food sciences, nutrition, and related areas.

1.2

THE GOALS OF EDUCATION

The goals of education, which follow, are given in *Ontario Schools, Intermediate and Senior Divisions.*

> The Ministry of Education in Ontario strives to provide in the schools of the province equal opportunity for all. In its contribution to programs, personnel, facilities, and finances, the ministry has the overall purpose of helping individual learners to achieve their potential in physical, intellectual, emotional, social, cultural, and moral development. The goals of education, therefore, consist of helping each student to:
>
> 1. develop a responsiveness to the dynamic processes of learning;
> 2. develop resourcefulness, adaptability, and creativity in learning and living;
> 3. acquire the basic knowledge and skills needed to comprehend and express ideas through words, numbers, and other symbols;
> 4. develop physical fitness and good health;
> 5. gain satisfaction from participating and from sharing the participation of others in various forms of artistic expression;
> 6. develop a feeling of self-worth;
> 7. develop an understanding of the role of the individual within the family and the role of the family within society;
> 8. acquire skills that contribute to self-reliance in solving practical problems in everyday life;
> 9. develop a sense of personal responsibility in society at the local, national, and international levels;
> 10. develop esteem for the customs, cultures, and beliefs of a wide variety of societal groups;

11. acquire skills and attitudes that will lead to satisfaction and productivity in the world of work;
12. develop respect for the environment and a commitment to the wise use of resources;
13. develop values related to personal, ethical, or religious beliefs and to the common welfare of society.

The preceding goals are not arranged in any hierarchical order, nor are they discrete categories from which a checklist should be made. The integrated nature of learning and the complex pattern of human development preclude such a sequential or fragmented approach. The translation of the goals into curriculum objectives, however, will undoubtedly result in sequences of learning appropriate to the particular levels and stages of development of the students for whom programs are being planned.*

1.3

THE AIMS OF FOOD AND NUTRITION SCIENCES COURSES

It is intended that the aims of the food and nutrition sciences courses at all levels of difficulty be consistent with and relate to the pertinent goals of education previously outlined.

The food and nutrition sciences program shall provide students with opportunities to develop:

- an awareness of the value of sound nutrition;
- an understanding of the social, cultural, political, religious, and economic aspects of food and their influence on individuals and society;
- an understanding of the influence of social, cultural, religious, and individual beliefs, values, and preferences on people's decisions about food and nutrition;
- an understanding of the relationship between a person's lifestyle, food choices, and nutritional well-being;
- a knowledge of the composition and function of food;
- an understanding of the criteria used to assess the validity of information on food and nutrition;
- an awareness of the impact of technological change on food and nutrition;
- the ability to make appropriate decisions about food and nutrition;
- the ability to think critically about and to analyse personal and societal nutritional issues;
- an awareness of career opportunities in the field of food and nutrition sciences.

1.4

THE FOOD AND NUTRITION SCIENCES PROGRAM: POLICY

The food and nutrition sciences program comprises two Senior Division courses: Food and Nutrition Sciences I (NZN) and Food and Nutrition Sciences II (NZS).

This guideline provides the policy from which school boards shall plan, implement, and review a food and nutrition sciences program. The following conditions apply to credit courses developed from this guideline:

- Two Senior Division courses in food and nutrition sciences at the basic, general, and advanced levels of difficulty may be developed from this guideline.

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* Ministry of Education, Ontario, *Ontario Schools, Intermediate and Senior Divisions (Grades 7-12/OACs): Program and Diploma Requirements* (OSIS), rev. ed. (Toronto: Ministry of Education, Ontario, 1989), pp. 3-4.

- A maximum of one single-credit course may be offered at each of the basic, general, and advanced levels of difficulty from each course outlined in Part B of this guideline. Up to one credit may be obtained by a student in any one course. In those instances in which a course is delivered in a co-operative education mode within the requirements outlined in OSIS (subsection 5.11) and in the ministry publication *Co-operative Education: Policies and Procedures for Ontario Secondary Schools, 1989,* a maximum of three credits may be allotted for such a course.
- In order to preserve the cohesiveness of the program, no course developed from this guideline may be offered for less than one-half credit. Even though subsection 4.5 of OSIS permits the development of modular courses for fractional credits of one-quarter, no fractional credit of less than one-half is permitted in food and nutrition sciences. The principal should verify that modular courses maintain the integrity and intent of the program as outlined in this guideline.
- Any credit gained from Senior Division courses developed from this guideline may be used as the Senior social science credit that students require in order to be eligible for an Ontario Secondary School Diploma (OSSD).
- No prerequisites are required for food and nutrition sciences courses. Although there are no prerequisites, it is highly recommended that students take Food and Nutrition Sciences I before taking Food and Nutrition Sciences II.

Where there is insufficient enrolment for a particular course, a bilevel or multigrade class may be established (see subsection 5.5 of OSIS).

Within the food and nutrition sciences program, each course designed for the Senior Division will:

- reflect the goals of education;
- contribute to the attainment of each of the aims of food and nutrition sciences;
- reflect the appropriate course objectives and content outlined in Part B.

It must be remembered that the aims and content of food and nutrition sciences are equally relevant to young men and young women. It is therefore expected that all courses will be planned for co-educational classes and will contain a balance of references to the needs and perceptions of both men and women. (See also section 2.2, “Gender Equity”, in this part of the guideline.)

It is also expected that the needs of students with differing learning abilities and interests will be met, either within each course, through some form of individualized instruction, or in separate courses with different emphases or different levels of difficulty. (Additional suggestions in this regard are provided in subsection 2.3, “Exceptional Students” and in section 3, “Planning Instructional Approaches”.)

2. CONSIDERATIONS IN DEVELOPING PROGRAMS

2.1

NEEDS OF ADOLESCENT STUDENTS

During their years in the Senior Division, students are maturing into young adults. The developmental tasks of the late adolescent years include: adjustment to the approaching independence from parents and other authority figures; establishment of effective social and working relationships with others; preparation for a possible vocation; and the further development of a system of values and a sense of identity. Courses in food and nutrition sciences should recognize these tasks and respond to the needs and interests of students in the Senior Division by encouraging the development of resourcefulness, creativity, and independence.

Students in the Senior Division are increasingly aware of the variety of lifestyles in our multicultural society and of the plethora of often-confusing information about food and nutrition. This stage of their development is an opportune time for them to learn to appreciate the complex interaction of factors that affect their own day-to-day food choices and their attitudes towards personal well-being. They are ready to examine the values that underlie personal and societal decisions concerning food and nutrition as well as a variety of nutritional issues (e.g., growth-spurt needs of children and young people; the need to develop and improve body structure and function, and the use of fitness activities, sports, dance, and other activities to meet an individual's physical needs throughout life).

Senior Division students will also be interested in experiencing, in real or simulated ways, certain aspects of various jobs or careers in food and nutrition sciences.

2.2

GENDER EQUITY

The Ministry of Education mandates that all courses in Ontario schools be equally available to both female and male students. This policy has special significance in food and nutrition sciences.

This guideline provides for the development of a program that has equal applicability and appeal to male and female students. It is intended that the learning environment, including the resources and teaching strategies used, avoid perpetuating both implicit and explicit sex-role stereotyping. Teachers should, therefore, be sensitive to the needs of both sexes when preparing courses of study. Inviting both women and men with careers in food and nutrition to speak to students is a way of presenting information and of overcoming stereotypical thinking.

2.3

EXCEPTIONAL STUDENTS

Under the Education Act and its regulations, exceptionalities are defined as behavioural, communicational, intellectual (including gifted), physical, and multiple. Exceptional students are identified through an Identification, Placement, and Review Committee (IPRC). (See subsection 2.3 of OSIS.)

The Education Act requires that appropriate special education courses and programs be provided to accommodate exceptional students' individual needs.

Exceptional students should be provided with the opportunity to participate in food and nutrition sciences courses at levels congruent with their interests and aptitudes.

In preparing to teach exceptional students, teachers should acquire information about the students from resource staff who know the students, through observation and personal contact with each student, and through ongoing consultation with parents or guardians.

Teachers shall modify the teaching strategies, pacing, assessment and evaluation, and facilities and equipment used in the food and nutrition sciences program to meet the needs of students with a variety of exceptionalities. The modifications required may be quite extensive and may include the use of specially designed learning areas and resources for students with severe disabilities, as well as extra supervision. Student assignments may also vary as required. For example, oral presentations could be used instead of written assignments, and microcomputers could be used by students who cannot talk nor write.

Although the use of a variety of assessment techniques, both formal and informal (see section 5, "Evaluation", in this part of the guideline) is important for all student evaluation, it is especially important when evaluating exceptional students, for it enables the teacher to obtain a more personal and complete picture of each student.

The programs offered to exceptional students must be assessed regularly and modified whenever the results of the program assessment and of student evaluation indicate that a change is necessary.

The following Ministry of Education publications contain suggestions on teaching strategies for pupils with various exceptionalities:

- *Behaviour* (resource guide, 1986)
- *Handbook for Teachers of Students With Learning Disabilities* (resource guide, 1986)
- *Hearing and Communication* (resource guide, 1991)
- *Planning for Independence: A Support Document for Teachers of Students With Intellectual Disabilities* (resource guide, 1990)
- *Programming for the Gifted* (resource guide, 1985)
- *Vision* (resource guide, 1987)

The suggestions that follow are intended to give teachers a sample of ideas for teaching exceptional students.

Students With Behavioural Exceptionalities

- Additional supervision should be provided around potentially dangerous tools and equipment.
- Tasks should be assigned at each student's level of ability to maximize his or her opportunities for success and satisfaction.
- Routines should be consistent and carried out with minimal disruption.
- Specific tasks should be defined at the outset, and a schedule of activities should be maintained.
- A quiet area should be provided for students who are temporarily unable to cope.
- Acceptable behaviour should be consistently reinforced in a positive manner, and

misbehaviour should also be handled consistently, so that students understand the cause-and-effect relationship between their behaviour and its consequences.

Students With Communication Exceptionalities

- New vocabulary should be taught in context; objects used in class activities should be labelled.
- Visual and auditory aids should be used to reinforce printed materials.
- Classroom distractions should be reduced to a minimum.
- A variety of modes for completing assignments should be provided to students to eliminate physical barriers to self-expression (e.g., the provision of microcomputers and appropriate software for students who cannot talk nor write).

Students With Physical Exceptionalities

- Floors should be free of obstructions and covered with non-slip materials.
- Additional space and modified equipment or tools might be required to accommodate a student in a wheelchair.
- Microcomputers, computer software, Bliss Symbolics, or other resources should be provided for students who are unable to communicate by talking or writing.
- If necessary, students should be given extra time for the completion of assignments. Where appropriate, the amount of writing should be reduced or perhaps eliminated and alternative methods of recording (e.g., tape-recorders) utilized.
- Videotaped demonstrations may be helpful for student review.

Students With Intellectual Exceptionalities (Other Than Gifted)

- Rules should be consistent and should be expressed simply and clearly. Sequential instructions that are developed in logical steps should be used.
- The development of individual skills should be stressed, and competition avoided.
- New skills should be demonstrated and their practice supervised, especially when activities involve the use of potentially dangerous equipment.
- Functional language skills should be reinforced in each lesson if possible. Print materials should be chosen to suit students' reading levels.
- Improvements in levels of performance should be expected, encouraged, and acknowledged.
- Immediate feedback should be provided to students.

Students With Intellectual Exceptionalities (Gifted)

- Creativity, divergent thinking, and skills of analysis, synthesis, and evaluation should be encouraged.
- Individual projects requiring independent study should be emphasized. High standards should be maintained to encourage students to extend themselves.
- Students should be encouraged to develop organizational and leadership skills through the use of class presentations in which they make use of a wide variety of media and of the new technology.
- Outside resources, including personnel, facilities, and equipment, should be used. Teachers should draw on the expertise of people in the community to enhance learning activities.

2.4
ETHNOCULTURAL EQUITY AND ANTIRACISM

An awareness of the cultural and racial composition of Canadian society is essential to all Canadians. Teachers should develop courses that are consistent with the educational goals of ethnocultural equity and antiracism and that reflect fairly and accurately Canada's multicultural, multiracial, and multifaith society. Food and nutrition sciences can contribute to the attainment of these goals, since nutritional patterns and food choices often reflect cultural traditions. Furthermore, the food and nutrition sciences courses can help students understand what it means to be Canadian by appreciating the distinct differences and emphasizing the similarities that exist among various ethnocultural and racial groups.

In particular, the food and nutrition sciences program will assist and encourage students to:

- understand and appreciate the points of view of ethnocultural groups other than their own;
- acquire the social skills and attitudes that will enable them to work effectively and responsibly within Canada's diverse society.

2.5
ADULT STUDENTS

Adults enrolled in regular school programs may be integrated into regular classes or grouped in classes composed exclusively of adults. Where adults are integrated into regular classes, relatively small adjustments in planning may provide substantial benefits for the adult learners as well as enrich the experiences of the adolescent students.

In designing courses of study for adults, teachers should adapt course content and use teaching strategies that meet the needs of adult learners. The following are some characteristics of adult learners that will influence the courses of study designed for them:

- Most adult learners consider formal learning as subsidiary to their primary role. Their enrolment in formal learning programs is voluntary.
- They tend to have a broad range of experiences, to come from many different backgrounds, and to have a variety of interests, attitudes, occupations, and family responsibilities.
- They are motivated to undertake formal learning for a definite purpose.
- They tend to have a preferred mode of learning that has been defined through their past learning experiences.
- They are very pragmatic and therefore prefer learning experiences that are problem-oriented.

Food and nutrition sciences courses should provide an opportunity for interaction between adult and adolescent students in which both can explain their experiences and points of view. Teachers should take advantage of the characteristics listed above and modify teaching and learning techniques to accommodate adults within the program. Although the following suggested techniques are suitable for most classroom situations, they are especially important for programs that include adult learners.

- The learning objectives should be reasonable, rational, relevant, and purposeful.
- The level of language used in instructing adult learners should reflect their level of maturity.
- The experiences of adult learners should be utilized in the classroom.
- Teaching strategies should include small-group discussions and individualized learning.
- Self-direction and autonomous learning should be encouraged by providing learners with increased responsibility for task analysis, determination of course content, and choice of evaluation methods.
- Courses should be provided at appropriate levels of difficulty to accommodate the learning abilities of adults.
- A safe and comfortable learning environment should be provided.
- Immediate feedback should be provided, and regular encouragement should be offered in order to help adult students take charge of their learning process.
- A broad range of evaluation methods, both formative and summative, should be used.

3. PLANNING INSTRUCTIONAL APPROACHES

3.1
THE LEARNING PROCESS

Students are expected not only to acquire knowledge, attitudes, and skills in food and nutrition sciences, but also to become more skilled as learners, to analyse problems independently, and to derive satisfaction from both independent and co-operative accomplishments. These objectives can be attained by involving students in research, discussion, observation, and collaboration activities. It is expected that courses of study will identify intended learning processes as clearly as they do the course objectives and content and that appropriate learning experiences and assessment and evaluation activities will be used to help students achieve the objectives. Students should progress in their ability to draw valid conclusions, not only about the subject content in the cognitive, affective, and psychomotor domains, but also about the processes by which they learned.

Learning activities should also help students develop a positive self-image. This can best be accomplished by providing students with opportunities to:

- develop new skills and abilities;
- express their ideas in an accepting atmosphere;
- improve their interpersonal skills;
- accept and carry out responsibilities;
- set and achieve short- and long-term goals.

The practice of differentiating between the theoretical and the experiential parts of a course as though they were separate entities is inappropriate for food and nutrition sciences. Although knowledge must be acquired before it can be applied, theory can and must be illustrated, demonstrated, and clarified through learning experiences that involve the students in active and interesting ways. Both theory and practice are essential to this program, and they should be integrated in courses developed from this guideline.

Teachers may find that sound theory in nutrition is not always easy to identify. Some recommended practices in the fields of food and nutrition may be based on untested hypotheses, common usage, personal preference, or the values of a specific group or individual; nutrition, especially, has been subject to the influence of faddists, self-styled experts, and purveyors of folk myths. Teachers should, therefore, assess the nature and authenticity of the sources of the information.

Food and nutrition sciences courses should involve students in inquiry work, independent-study activities, group work, and the planning and completion of projects. A number of selected instructional approaches are described in the following section. The list is not intended to be exhaustive, but has been designed to highlight a few approaches that are appropriate to food and nutrition sciences courses.

Instructional Approaches

Experiential learning. In experiential learning a collection of concrete experiences is used to help students test and develop their knowledge and skills. Since experiential learning is an essential part of food and nutrition sciences, concrete learning experiences are to be included in courses developed from this guideline.

Simulations can also be used to help students understand a wide variety of real-life situations. The skilful use of questions and group discussion following such simulations can help students derive generalizations from them.

Inquiry method. The inquiry method requires students to ask, as well as respond to specific questions that can be answered by the use of different types of thinking (i.e., critical, analytical, imaginative, conjectural). An initial activity on a specific topic or theme can be used to stimulate students' questions, which should then be developed into inquiry-type questions. Such questions should be appropriate to the content and aims of the unit of study. Students will answer the questions by gathering information, seeking alternatives, and selecting alternatives.

The basic inquiry model presented in the Ministry of Education document *Research Study Skills* (Curriculum Ideas for Teachers, 1979) provides a structured framework that will help students identify and understand a variety of issues and will provide them with strategies for completing specific projects.

Small-group activities. Since much of learning involves social interaction, the use of small groups can increase the opportunities for students to learn more effectively. Many activities that involve the understanding and application of theory may be handled best in small groups. If group work is to be effective, the purpose of the activity and the procedures to be followed should be stated clearly before beginning the activity.

Co-operative learning. Co-operative learning describes structured activities in which students work together. Small-group work is fundamental to co-operative learning. Depending on the maturity level and the skills of the students, co-operative learning activities can range from simple, teacher-structured activities to complex activities that are planned co-operatively by the students and teacher. For the latter type of activity, students help plan the objectives, learning experiences, resources, methods of assessment, and criteria for evaluation.

Independent study. Independent study allows students to investigate topics that are of interest to them. It also helps them acquire independent learning skills.

As a course progresses and students learn the techniques of independent study, they can become increasingly independent. Learning packages and computer-assisted instruction may be helpful at first, since they allow students to work independently within a specific time frame. Although independent study may occur outside the classroom framework, it may also take place within the classroom setting for one or all of the students (see subsection 6.3 of OSIS).

Students choose, plan, carry out, and evaluate their own learning experiences after they and the teacher have finalized a plan. Students have some control over one or all of the following: the frequency and duration of meetings with the teacher and of study sessions; the choice of subject matter; the sequence of units and depth of treatment of the objectives; the decisions on their readiness for assessment; the criteria for evaluation; and the choice of instructional and learning methods. The more students participate in determining the components of their learning, the more independent they become.

Individualized learning. The individualized learning method is built on the premise that students who engage in a learning program that meets their specific interests and learning needs not only learn but also acquire a wider range of learning skills. Although the teacher still plays an active role in the teaching-learning process, he or she may act mainly as a resource person and as a catalyst for student pursuits.

For individualized learning, the teacher generally acts as an adviser, providing an outline of the objectives of the unit of study, working with students to develop a plan of action to meet these objectives, and discussing with students, at predetermined intervals, the direction of their inquiries. Contracts between the teacher and students may be used to establish the timelines and to clarify the procedures to be followed.

Evaluation of individualized learning should take into consideration the degree of development of the student's individualized learning skills. It should include self- and peer evaluation in addition to evaluation by the teacher.

Learning-activity packages. In a learning-activity package, the main ideas to be learned are outlined, the objectives are stated, and a variety of learning experiences are described clearly so that students can follow the directions, individually or in groups. Instructions in the use of the package should also be provided. A well-designed package should provide flexibility in the use of time and the choice and sequence of units.

The learning experiences in a package are chosen to enable students to achieve the stated objectives. Such learning experiences should involve students in active learning.

Evaluation based on achieving the stated objectives, as well as evaluation of the learning-activity package itself, should be an integral part of the package.

The most relevant learning-activity packages can be those designed by teachers and students. However, commercially available packages, including computer software (e.g., programs that help individuals to analyse their personal diets), can be effective when they are adapted for local use.

3.2

LANGUAGE ACROSS THE CURRICULUM

Since the language activities of reading, writing, speaking, and listening are the basic means of learning common to all subject areas, teachers must ensure that these four aspects of language receive appropriate emphasis and treatment in food and nutrition sciences. Students should learn the specialized terminology of food and nutrition sciences and use it to explore concepts, solve problems, and explain ideas. Learning activities involving writing in a variety of genres should also be encouraged.

Discussion is an important part of any course and helps students develop their language skills. Discussion can take place in small or large groups and can take the form of panel discussions, forums, symposiums, debates, seminars, and group problem-solving sessions. In order for discussion to be productive, students need to know why they are discussing a topic, as well as something about group dynamics and the various roles of group members. Teachers should ensure that the conclusions of any discussion group are valid or at least that the conclusions reached could lead to further investigation.

3.3

COMPUTER APPLICATIONS IN FOOD AND NUTRITION SCIENCES

The computer has many advantages as a learning tool for students in food and nutrition sciences. With the expanded use of computer technology within the food industry and the workplace, as well as the increased use of microcomputers in the home, courses in food and nutrition sciences must incorporate knowledge, skills, and attitudes related to computer technology. To do this, teachers can:

- explore the capabilities and applications of computers in assisting with the learning process in the classroom;
- encourage students to use word processing in preparing reports and other written work;
- have students explore ways in which computer technology is directly affecting the food industry (e.g., inventory-control software, teletext and videotext data on where and how people shop);
- encourage students to explore ways in which persons working in the area of food and nutrition use computers in their day-to-day work (e.g., the use of computer-compiled statistics).

3.4

INFORMATION ON CAREER OPPORTUNITIES

All students should be made aware of the employment opportunities that are available in the field of food and nutrition sciences. Many service professions (e.g., nursing, food preparation, food processing) make use of the skills developed in food and nutrition sciences and offer career opportunities for students of this program. Students should be provided with current information on the educational requirements for university and community college programs. Students should also be provided with information on the current expectations of employers in the field of food and nutrition sciences.

Careers and occupations related to the field of food and nutrition sciences include agricultural representative, hotel food administrator, food and beverage manager (catering and lodging), sales representative, waiter/waitress, food scientist, food technologist, nutritionist, dietitian, food photographer, journalist, cook, baker, and chef.

Information on postsecondary education and employment opportunities can be found in the database of the Student Guidance Information Service (SGIS). Students and teachers may access this database by using a microcomputer or by writing to the Ministry of Education.

Guidance counsellors and teachers should work together to:

- provide students with the information they need to make appropriate educational decisions;
- assist students in making their subject selections;
- advise students on the most appropriate education or training programs to meet their needs;
- teach students job-application and interview skills;
- obtain the services of professionals in selected fields to act as student mentors.

Students should also be encouraged to consider current employment trends and possible changes in future employment opportunities. It is important for students to understand that technological developments are radically changing the character of many work environments, and that as a result of these changes, many traditional jobs are being redefined. Career education should acknowledge that the jobs and work skills in the food and nutrition industry may continue to undergo change throughout an individual's lifetime.

3.5
SAFETY CONSIDERATIONS

An awareness of the importance of safety and the development of student vigilance in matters of safety and accident prevention should be an objective of all courses developed from this guideline.

Teachers of food and nutrition sciences play a key role in helping students develop positive attitudes towards safety and safe work habits. A class program on safety introduced at the beginning of any course should focus on general procedures and rules, as well as on formal school board safety policies. All teachers should be familiar with the relevant provisions of the provincial Education Act, Workers' Compensation Act, and Occupational Health and Safety Act, as well as with the safety policies of the Ministry of Education and their school board.

To ensure a safe educational or working environment, students shall adhere to safe practices and demonstrate their knowledge of the appropriate use of all materials, tools, and equipment. Students must understand that dull, broken, or improperly adjusted tools and equipment are a frequent cause of minor injuries. Furthermore, students must understand the hazards inherent in the improper storage of foods and in improper grooming and dress, both in the classroom and the workplace. Instruction is also required in the safe handling of cleaning substances commonly used in the food industry that may cause a toxic reaction in certain individuals (e.g., disinfectants, detergents, bleaches).

4. DEVELOPING A COURSE OF STUDY AND INSTRUCTIONAL UNITS

4.1
COURSE PLANNING

Within the rationale of this guideline it is permissible to develop two Senior Division courses leading to the OSSD. Part B of this guideline outlines the objectives and content for each course.

Levels of Difficulty

The courses developed from this guideline may be offered at the basic, general, and advanced levels of difficulty. The general characteristics of the three levels of difficulty are outlined below.

Basic level. Basic level courses should focus on increasing students' awareness of the relationship between nutrition and well-being. They can also provide students with practice in decision-making by having them assess possible career choices in areas such as the hospitality industry, health-care settings, and a variety of other food operations. The theoretical knowledge and concepts presented should be directly related to classroom experiences and should be useful to students.

General level. General level courses in food and nutrition sciences should help students develop the attitudes, skills, knowledge, and understanding that they will require for employment, a career, or further education at a college of applied arts and technology or other postsecondary educational institution.

Advanced level. Advanced level courses should focus on the development of academic skills and should prepare students for entry into university or colleges of applied arts and technology.

Such courses should help students understand the theoretical principles, practical applications, and content of food and nutrition sciences and should emphasize the development of critical-thinking and creative problem-solving skills.

4.2
THE COURSE OF STUDY

The purpose stated at the beginning of each course in Part B of this guideline describes the expected outcomes. The objectives and activities that make up the food and nutrition sciences program help students achieve these outcomes.

In preparing a course of study, educators must:

- identify the provincial goals of education that will support the aims and objectives of food and nutrition sciences;
- assess the needs of students in relation to the particular food and nutrition sciences program being considered.

A course of study shall contain the *name of the guideline* from which the course is being developed, as well as a description of the course, its level of difficulty, credit value, aims, objectives, unit headings, content, methodology, and strategies for assessment and evaluation. Time requirements and the main resources for each unit should also be identified.

The *course description* should provide a statement of intent for the program. It should identify the students for whom the course is intended (e.g., that it is an introductory course at the general level of difficulty for students in Grade 11 or 12), as well as the course's potential application to students' employment or postsecondary education. Any additional information that would be useful to students, such as the availability of a co-operative education component, should also be indicated.

The course *aims and objectives* should be specified under separate headings. They should focus on the knowledge and skills to be acquired by students and should be consistent with the objectives identified for each course in Part B of this document.

The *content* identified in this guideline should be listed. Some guide to the time allocation for each unit of content is essential; however, these time allocations should be approximate, as some flexibility is necessary to meet the specific needs of different groups of students.

The techniques for *assessment* and the criteria to be used in evaluating student achievement should also be indicated.

The *resources* required for students and teachers involved in the course should be outlined. In food and nutrition sciences these fall into the following categories: texts and reference books, human resources, audio-visual materials, equipment and tools, supplies, computers and software, and community and classroom facilities. Specific resources should be directly related to the content and corresponding learning experiences planned for the course.

4.3
INSTRUCTIONAL UNITS

The outline of instructional units reflects the strategies to be used for managing the entire course and is the responsibility of the teacher. The outline should identify the following:

- the characteristics of the students taking the course, namely, their personal attributes, their educational needs, their expectations for the course, their notions of issues that are important and skills and knowledge that are necessary
- the specific learning objectives to be achieved
- the teaching strategies
- the strategies for assessing, evaluating, and improving student achievement
- the strategies for assessing and evaluating course effectiveness and for making appropriate modifications to the course where necessary

In planning units and lessons, the teacher must translate the objectives and content into precise statements that describe the skills, knowledge, and attitudes that students are expected to gain. Learning experiences must integrate theoretical knowledge with experiential activities. In establishing the sequence of units, teachers should ensure that they provide students with a perspective on the course as a whole.

The planning outline of the instructional units should also contain plans for the assessment and evaluation of student achievement, including lists of the criteria to be used. Students should always be fully aware, at the beginning of a course, of the assessment and evaluation techniques and criteria that the teacher will use.

5. EVALUATION

5.1
EVALUATION OF STUDENT ACHIEVEMENT

The evaluation of student achievement is one of the most important aspects of the education process. It involves making judgements about students' progress and achievement in relation to the aims and objectives of the program. Through the process of evaluation, the teacher and the student develop a profile of the student's competencies and needs and identify ways to meet these needs. It follows, then, that the evaluation and interpretation of what the student has learned should be an integral part of the instructional component of a course.

The purposes of student evaluation are to:

- provide students and parents or guardians with information about the students' progress in achieving the program objectives;
- help students identify any learning difficulties and ways to overcome them;
- ensure that informed decisions are made about each student's program by the student, by parents, and by teachers.

Evaluation also provides the teacher with the means of assessing his or her teaching methods and of judging the appropriateness of changes to individual or group activities to meet the needs of each individual in the class.

Teachers should use the following list of principles as the basis for assessment and evaluation of students:

- Evaluation procedures should reflect the aims and objectives of the food and nutrition sciences program.
- The continuous assessment of student achievement must be an integral part of the teaching-learning process. In any learning situation, students either are succeeding or are experiencing difficulty. Those who are experiencing difficulty are in need of encouragement and perhaps redirection or additional help. Ongoing assessment identifies difficulties quickly and provides a basis for immediate action.
- The form of evaluation should be appropriate to the task being evaluated, the kind of learning taking place, and the stage of learning.
- Specific criteria for all evaluation of student achievement, including teacher, self-, and peer evaluation, should be clear and understandable and should always be communicated to students well in advance of the evaluation.
- The effect of evaluation must always be formative and constructive.
- Students should develop the ability to assess their own skills and achievements through self-evaluation. Teachers may wish to evaluate certain tasks in co-operation with the students prior to having students practise self-evaluation.
- Peer evaluation must be handled with sensitivity if it is to have a positive effect on students. As students gain experience in evaluating the work of others and having their own work evaluated by others, they will learn more, both directly and indirectly, about their achievements, abilities, interests, and aspirations.

Types of Evaluation

Although there are a variety of approaches to evaluation, three general types of evaluation are suggested for teachers of food and nutrition sciences programs. These three types of evaluation are outlined below.

Diagnostic evaluation. Diagnostic evaluation is done when there is evidence to show that a student is experiencing difficulty.

This type of evaluation can be done formally or informally. The main purposes of diagnostic evaluation are to determine the underlying reasons for the learning difficulties, to assess the student's special needs (e.g., specialized equipment, extra materials), and to provide the teacher with information on how best to support the student's learning process.

Formative evaluation. Formative evaluation occurs throughout a course when students are studying new material. The main purpose of formative evaluation is to identify for the teacher those areas that require review as well as those that require further and perhaps different instructional attention. The data collected in formative evaluation should be analysed and used to modify and improve the quality of the course and the teaching-learning process.

Students should always be shown the results of this evaluation.

Summative evaluation. Summative evaluation takes place at the end of a topic, unit, section, or course. Summative evaluation determines the level of student achievement and the effectiveness of the program. Summative evaluation tends to be concerned with students' overall performance. As with formative evaluation, the results of summative evaluation should be shown to the students.

It is important to stress that formative and summative evaluation are best viewed along a continuum. The results of formative evaluation can help determine what form the summative evaluation will take.

Assessment Strategies

To assess student growth and progress, teachers should listen to, talk with, and observe students as they think through problems, work on projects, and participate in group activities. A variety of procedures can be used to assess students' growth in knowledge and skills, the development of their ability to think critically, and the development of positive attitudes to food and nutrition. For example, in addition to tests and teacher observation, a range of other techniques should be used, including checklists, journals, presentations, interviews, discussion of students' personal reflection, small-group activities, peer evaluation, research projects, reports, and computer simulations. In all instances, evaluation procedures should be appropriate to the aims and objectives of the program. Specific criteria for evaluation of student achievement should be clear and understandable. The criteria should be communicated to students well in advance of the evaluation.

Some strategies for assessing student growth and progress in food and nutrition sciences are described below.

Listening to students. The student is the key person in the learning process. If the learning situation is to meet his or her needs, then the teacher must listen to what the student says. This may be done formally and informally. Listening while students are involved in their own learning provides the teacher with the opportunity to intervene, either to support students personally, or to ask critical questions that may encourage and direct progress, or to suggest appropriate changes.

It is essential that teachers allow time during class to hear what students think or feel. Students who feel that teachers are listening to them are likely to respond more positively; teachers who listen are likely to ensure that the needs of students are being met in the teaching-learning process.

Observation. A great deal of information about student growth and progress can be obtained by watching the activities of students, interpreting their behaviour, and then talking with students about the behaviour. Observation can be done informally as an integral part of the learning process or in a more systematic way. For example, the use of checklists based on specific criteria that are relevant to the aims and objectives of food and nutrition sciences may help the teacher assess the achievement of students in a systematic manner.

When using observation as a method of evaluating student achievement, teachers should consider the following suggestions:

- using specific criteria when establishing the checklist or observation schedule;
- focusing on a small number of criteria at any one time;
- developing a strategy or plan for carrying out the observation;
- ensuring that the observation strategy and instruments correspond to the students' stage of development;
- keeping informal notes to enrich the observation data;
- ensuring that the observation findings are discussed with the students and that they contribute to the learning process;
- varying the observation process by using audiotapes or videotapes of student activities.

Student presentations. The evaluation process must be linked to student presentations. Evaluation of presentations should be based upon clearly stated criteria, for both the content of the presentation and the manner of presenting the information, which should be communicated to students before the presentation. Strengths and weaknesses of the presentation should be discussed and self- and peer evaluation encouraged.

Student projects. In food and nutrition sciences, students should be encouraged to undertake projects and complete them within a predetermined time period. Detailed timelines can identify dates for the completion of specific tasks that form part of each project. When a project is assigned, the following headings may clarify the parameters of the task:

- a statement identifying the project or choices for a project;
- a precise list of objectives that indicate the expectations for the project and for student learning;
- a description of the process that might be used when doing the project;
- a timeline which identifies dates for an interim draft presentation of the project, consultation, and the deadline for the final project; and
- the criteria that will be used for evaluating the project.

5.2

EVALUATION OF FOOD AND NUTRITION SCIENCES PROGRAMS

Program evaluation is integral to all phases of program development and implementation. Initially, data may be collected to determine the need for a food and nutrition sciences program or the modifications required to an existing program to meet the requirements of this guideline and the needs of the school community. In this sense, program evaluation provides data that can be used for future planning. Program evaluation also has a review function: to determine whether the existing program is meeting the purposes for which it was planned. When it has been determined that revisions are needed, program evaluation can identify the direction that the changes should take.

When evaluating a food and nutrition sciences program, the following areas should be looked at:

- aims and objectives
- program design
- concepts and content
- teaching strategies
- resources and facilities
- evaluation of student achievement

A variety of assessment instruments and methods should be used to evaluate the program. One method is the use of an assessment instrument such as a questionnaire that can be distributed to a variety of groups, including students, food and nutrition sciences teachers, other teachers, principals, supervisory officers, trustees, parents, industry personnel, and other members of the community. Interviews and analysis of all the program activities and materials are important ways of obtaining additional data to expand the survey findings and obtain a more complete picture of the value and worth of the food and nutrition sciences program.

6. ORGANIZATIONAL ALTERNATIVES

6.1
SCHOOL- AND COMMUNITY-RELATED PACKAGES

The term *school-related package* identifies a set of courses planned by the school to provide a curricular emphasis for students who may have a specific educational or career goal in mind. Such a goal could include post-secondary education, training in a particular field, general education in a specific area of study, or direct entry into employment. Through collaborative planning, teachers can build mutually reinforcing relationships among courses within a particular package in the school. A further explanation of school-related packages may be found in subsection 5.9 of OSIS.

The term *community-related package* identifies a set of courses planned jointly by the school and the community to provide students with a curricular emphasis related to the major economic base of the community. For example, in an area where tourism is the main source of revenue, a community-related package might include courses in English, French, business, and food and nutrition sciences. Additional information on community-related packages may be found in subsection 5.10 of OSIS.

Any package having food and nutrition sciences as the subject of concentration should introduce students to skills and knowledge associated with a range of possible occupations. Such a package should allow students to enter the workplace either following graduation from secondary school or after additional study in a postsecondary institution.

6.2
WORK EXPERIENCE

Work experience provides a student with a learning opportunity in the workplace as an integrated part of a specific course. The student is under the supervision of an employer for a limited period of time without pay. Work experience thus provides the student with opportunities to practise and reinforce, on the job, the skills and knowledge acquired in school. It also provides the student with an orientation to the workplace and with opportunities to explore various careers through discussions with experienced workers.

Work experience is normally limited to one or two weeks in any one school year and in no case shall it exceed a total of four weeks in any one school year. Work experience should always be carefully planned in advance. "The activities and objectives of the learning experiences in which the student is to be involved must be discussed beforehand by the teacher and employer or supervisor. Evaluation reports on the student's experience are prepared by both the employer and the student.

Every precaution must be taken to assure the safety and protection of students on the job. Safe work stations, special instruction on safe practices, safety clothing, and the provision of Workers' Compensation Board coverage for students are all factors to be considered when out-of-school work experience components are planned" (OSIS, subsection 5.12, page 27).

6.3

CO-OPERATIVE EDUCATION

Co-operative education can be used by boards and schools to link the school with the world of work. It should provide students with realistic expectations of the day-to-day practices and requirements of business and industry. In some cases the out-of-school co-operative education placements may provide necessary experience that is not readily available in the school. Experience in food and nutrition sciences may be obtained through placements in hospitals, nursing homes, food-processing plants, or food research laboratories.

In all cases, the co-operative education component must maintain the integrity of the educational objectives stated in this guideline. Both school officials and employers have a responsibility to monitor each student's progress to ensure that the course objectives are being met.

The parameters within which co-operative education can take place are set out in the ministry document *Co-operative Education: Policies and Procedures for Ontario Secondary Schools, 1989.* Practical suggestions for implementing co-operative education programs are provided in the ministry's companion document *Co-operative Education,* A Resource Guide, 1990.

PART B

COURSES

FOOD AND NUTRITION SCIENCES I (NZN)

This course consists of the following five units:

1. Food, Society, and Culture
2. Nutrition and Health
3. Food Production and Supply
4. Food Choices
5. Careers in Food and Nutrition Sciences

PURPOSE

The purpose of this course is to make students aware of the social significance of food as well as the relationship that exists between food, nutrition, human physiology, and well-being. Through an examination of factors that have an impact on food production and supply, and consequently on food choices, students will understand the food industry in Canada. The variety of career opportunities in the food industry and in the field of nutrition will also be examined.

UNIT 1

FOOD, SOCIETY, AND CULTURE

The intent of this unit is to help students understand the social significance of food in different societies and cultures.

Objectives	Content
Students will be provided with opportunities to:	
a) identify the social, psychological, and physiological reasons for eating;	– the socio-cultural importance of food in social interactions such as celebrations and gatherings of friends, in family rituals, in the transmission of culture and family traditions, as a symbol of hospitality, and as a status symbol – the psychological importance of food (e.g., in the relief of tension, the counteraction of boredom or anger, or the satisfaction gained from eating) – the physiological importance of food in the growth, sustenance, and repair of the body and the maintenance of well-being
b) examine the social importance of food in all societies and cultures;	– eating as one primary way of initiating and maintaining human relationships in all societies – the transmission of culture through family meals
c) examine patterns of eating in various societies and cultures;	– an overview of food preferences in various societies and cultures – an overview of the wide variety of tastes and food preferences displayed by societies around the world – a study of the manner in which children become familiar from birth with certain flavours that are characteristic of their socio-cultural group – the foods that form the basis of various cuisines around the world (generally these are the staple foods found in abundance locally) – the components of a cuisine: staple food, table manners, and utensils (the placement of utensils at the time of eating and their use)

Objectives	Content
	– the distinctions among cuisines (generally a distinction is founded on the “flavour principle”, that is, a sensory experience produced by the addition of specific flavouring ingredients to a staple, such as the addition of chili pepper, cumin, and tomato flavours to Mexican cooking)
d) identify some of the social and cultural factors that influence food choices in various cultures;	– the social and cultural factors that affect the acceptability of food: cultural customs, religious customs, values and attitudes – the social and historical beliefs and practices that relate to food in various cultures (e.g., the symbolic status of particular foods and the belief in the magical powers of certain foods) – the social controls that operate during eating – the social and cultural factors that affect food choices in Canada at present
e) become aware of the emotional significance of food;	– the feelings, such as love, intimacy, acceptance, or rejection, that individuals, from infancy, learn to associate with food and eating – the relationship between an individual’s personal food choices and eating patterns and the eating patterns and lifestyle of the individual’s family
f) identify current beliefs about food;	– current food fads or taboos and fallacies about food and the manner in which they are presented in the media (e.g., the sensationalist media presentation of fat-reducing diets that allow only one or two foods)
g) investigate the factors that cause changes in eating patterns.	– the influence of the new technology on eating patterns (e.g., advances in production technology and new means of supply and distribution) – the influence of education, social groups, and culture on eating patterns – the influence of the media on attitudes towards food

UNIT 2
NUTRITION AND HEALTH

The intent of this unit is to enable students to investigate the relationship between food, human physiology, and well-being.

Objectives	**Content**
Students will be provided with opportunities to:	
a) identify the nutrients required for the maintenance of good health;	– the nutrients required by an individual for the sustenance, growth, repair, and maintenance of the body at various stages of the life cycle (infancy, childhood, adolescence, adulthood, old age) – an examination of food as a source of energy for the body – the process of digestion, absorption, and metabolism of food – the nature of enzymes and their function in food digestion
b) examine the function and source of nutrients;	– the major classes of nutrients: carbohydrates, fats, proteins, vitamins, minerals, amino acids, and trace elements – the components and functions of nutrients – the variety of food group plans – the implications for different cultural groups of following certain food group plans – an examination of ways to achieve caloric control and nutrient density – the use of food exchange systems
c) identify the requirements for maintaining energy balance;	– energy balance: optimum weight, overweight, and underweight – incidence, causes, hazards, and treatment of obesity – incidence, causes, hazards, and treatment of underweight, bulimia, and anorexia nervosa – the nutrients required by an individual to maintain energy balance at various stages of the life cycle – the effects on energy balance of such external factors as physical activity, inactivity, stress, feasting, and fasting

Objectives	Content
d) become aware of the nutritional status of Canadians;	– an examination of the results of a variety of nutritional surveys such as the Canadian Health Attitudes and Behaviour Survey (conducted by Social Program Evaluation Group, Queen's University, in 1984-85) – the reasons for poor nutrition in areas in which an abundance of food is available – the factors that have contributed to an increased awareness among Canadians of the need for sound nutritional practices
e) identify the composition and nutritional value of a variety of foods and the implications of choosing those foods as part of their diet;	– the composition and nutritional value of a variety of food products – the effects of different methods of processing and storing food on its nutritional value
f) investigate Canadian legislation on nutrients and food labels;	– Canadian legislation governing the identification of nutrients on food labels – Canadian legislation governing the composition of enriched, fortified, and imitation food products
g) examine the types of food additives used and their functions;	– the terminology of food additives – the types of food additives and their functions (e.g., artificial colours, flavours, and flavour enhancers, antimicrobial agents, antioxidants, nutrient additives) – Canadian legislation governing the use of food additives – natural toxins in food
h) investigate the various sources of contaminants in food.	– the sources of contaminants in food: environment, improper handling, improper cooking and storage

UNIT 3
FOOD PRODUCTION AND SUPPLY

The intent of this unit is to familiarize students with the factors that affect food production and supply in Canada.

Objectives	**Content**
Students will be provided with opportunities to:	
a) examine the Canadian food production industry, with particular emphasis on regional differences;	– the location of the primary food sources in Canada – the influence of geography on food supply and production in Canada – the evolution of the Canadian food production industry – present-day food production in Canada (e.g., agribusiness, fish farming, meat and poultry farming, fruit and vegetable growing) – food production by Canada's Native peoples
b) identify the economic, political, and environmental factors that affect food production and supply;	– the effects of various economic factors on food production and supply (e.g., standards of living, personal and family incomes, employment and unemployment, methods of transporting food) – the impact of a variety of political factors on food production and supply (e.g., international food policies, national and provincial food policies, food market boards) – the effect of different environmental factors and concerns on food production and supply (e.g., energy and resources required to produce various foods, food contamination and environmental issues)
c) identify the stages of production for a variety of food groups;	– the stages of production and supply of various food groups (e.g., cereals and grains, meats, fruits, dairy products)

Objectives	Content
d) identify issues that have an effect on food production;	– the use of compounds, chemicals, and/or hormones for increasing yield – the types of food contamination that can occur at the stages of growing, harvesting, processing, transporting, and storing food (i.e., chemical, physical, biological, and nuclear contamination)
e) investigate the functions of the wholesale and retail food markets;	– the types of wholesale and retail food markets and their functions – the economic significance of the retail and wholesale food markets in Canada – the role of food marketing boards – the influence of immigration on local food markets – the process of moving food from the primary sources to the consumer
f) investigate food packaging and its relation to the marketplace.	– legislation governing the packaging and labelling of food products – different types of food packaging and their functions – food packaging and environmental issues

UNIT 4
FOOD CHOICES

The intent of this unit is to enable students to identify and explore the factors that affect food choices in Canada.

Objectives	Content
Students will be provided with opportunities to:	
a) identify the social, economic, and physical factors that affect food choices;	– the social factors that influence personal food choices (e.g., cultural traditions and customs, family socialization, peers, religious beliefs, personal preferences) – the economic factors that have an impact on personal food choices (e.g., international and national economic forces, personal and family economic factors) – the physical factors that influence food choices (e.g., geographical location, types of growing seasons, availability of food markets, home storage capacity)
b) identify the knowledge and skills that help individuals make sound food choices;	– the knowledge and skills (e.g., knowledge of sound nutrition, creative menu-planning skills) that enable individuals to make the best possible food choices using the resources that are available to them, such as time, money, personal skills, food equipment, types of food
c) identify the factors that have an impact on an individual's food choices at different stages of the life cycle;	– the factors that affect an individual's personal food choices throughout life (e.g., age, health, school and/or work schedules, lifestyle, special dietary needs) – ways to adapt sound food choices to specific needs – the influence on food choices of various nutritional guides, such as *Canada's Food Guide* (Health and Welfare, Canada, 1982), and *Canada's Food Guide: Handbook*, revised edition (Health and Welfare, Canada, 1985), Native peoples' food guides, vegetarian food guides, and international food guides

Objectives	Content
d) identify ways to maintain the high quality of food from the time of purchase by the consumer to the time of consumption.	– the characteristics and importance of high quality in food (e.g., high nutritional value, good appearance, suitable texture) – the characteristics of high quality in fresh, refrigerated, dried, and frozen food – the most appropriate ways of handling, storing, and preparing food to ensure optimum retention of nutrients – safety practices required in the handling and preparation of food – various types of safety considerations (e.g., personal hygiene and cleanliness of kitchen and equipment)

UNIT 5

CAREERS IN FOOD AND NUTRITION SCIENCES

The intent of this unit is to provide students with an overview of the career opportunities that exist in the food and nutrition sciences area.

Objectives	Content
Students will be provided with opportunities to:	
a) investigate career opportunities in food and nutrition sciences;	– an overview of the employment opportunities that exist in food and nutrition sciences in such areas as health and medicine, hospitality services, food technology and production – the educational requirements for careers in food and nutrition sciences – Canadian and international colleges and universities that offer food and nutrition sciences programs – the community-based resources available to assist students in a job search
b) explore the relationship between technological changes and career opportunities in food and nutrition sciences;	– an examination of technological, economic, and social changes and the resulting changes in the work environment and employment opportunities (i.e., the impact of technology and computerization, which results in the redistribution of jobs and may lead to unemployment or job retraining)
c) become aware of the skills and knowledge required for employment in a particular segment of the food industry or in the field of nutrition.	– an exploration of the competencies required for various careers in the food industry and the field of nutrition – the exploration and application of the knowledge and basic job skills required in the food industry and the field of nutrition through co-operative education programs and class field trips

FOOD AND NUTRITION SCIENCES 11 (NZS)

This course consists of the following four units:

1. Food, Nutrition, and Well-Being
2. Nutrition and Health
3. Food Supply and Safety
4. Trends in Food and Nutrition Sciences

PURPOSE

The purpose of this course is to enable students to explore, through a study of selected issues, the relationship between food, nutrition, lifestyle, and well-being. Using an issues approach, students will also investigate the factors that have had an impact on food production and on the availability of safe food in Canada, as well as examine current developments and future trends in food and nutrition sciences.

Note: The objectives in each unit of this course are to be achieved through an investigation of selected issues. While the issues outlined in the content are currently relevant to each objective, it is important to keep in mind that the field of food and nutrition sciences is complex and ever-changing. As other significant new issues emerge, they should be reflected in the course content.

UNIT 1

FOOD, NUTRITION, AND WELL-BEING

The intent of this unit is to enable students to explore the relationship between food, nutrition, and well-being.

Objectives	Content: Selected Issues
Students will be provided with opportunities to:	
a) explore the relationship between food, nutrition, and well-being from the perspective of the social sciences;	– an examination of the promotion of health and well-being as a sociological phenomenon, with particular emphasis on the changes in the meaning of health that have taken place during the twentieth century – the politics of marketing food to different age groups (e.g., the use of different slogans and packaging for different age groups, the "selling" of the concept of well-being through food) – the relationship between food, nutrition, and well-being in a variety of cultures – the influence of family members, peers, and the media on personal food choices – factors that lead to changes in eating patterns – a study, from a historical perspective, of the development of fast food in the postindustrial era (i.e., the reasons for its growth) – media ethics in food advertising: freedoms, responsibilities, and challenges
b) explore the relationship between food, nutrition, and well-being from the perspective of the biological sciences;	– the relationship between lifestyle and well-being (e.g., time for regular exercise, concern about fitness, eating of fast food) – the food requirements for various physical activities (e.g., cycling, tennis, dancing) – an individual's nutritional needs at the different stages of the life cycle

Objectives	Content: Selected Issues
	– the function of vitamin and mineral supplements and their relationship to well-being – causes of loss of nutrients from the body (e.g., lack of physical activity, drug and alcohol consumption)
c) explore the relationship between food, nutrition, and well-being from the perspective of the technological sciences.	– the technological development of food products for specific lifestyles, stages of the life cycle, and health or dietary needs (e.g., single-serving products, different-sized portions, foods that can be cooked in a microwave oven, products for infants and young children, foods with no cholesterol or salt, low-calorie foods) – the effect of technological advances such as "space nutrition" on food products

UNIT 2
NUTRITION AND HEALTH

The intent of this unit is to encourage students to explore the relationship between nutrition, lifestyle, health, and disease.

Objectives	**Content: Selected Issues**
Students will be provided with opportunities to:	
a) explore the relationship between nutrition, lifestyle, health, and disease from the perspective of the social sciences;	– the influence of socialization through the family and various social groups such as friends on individual eating patterns and attitudes towards food – the social conditions that can contribute to the incidence of illnesses and diseases (e.g., improper nutrition, the pressure of daily living, stress, etc.) – an overview of the growing body of knowledge concerning the relationship between lifestyle, food choices, and nutrition-related illnesses and diseases (e.g., cardiovascular disease, anorexia nervosa, tooth decay) – nutrition-related diseases and world demography – the social, economic, and political causes of malnutrition in Canada – the social conditions that contribute to nutrition-related illnesses (e.g., obesity, bulimia)
b) explore the relationship between nutrition, lifestyle, health, and disease from the perspective of the biological sciences;	– an analysis of the relationship between lifestyle, food choices, and some nutrition-related illnesses and diseases – causes and methods of prevention of some nutrition-related illnesses and diseases (e.g., cardiovascular disease) – analysis of the biological effects of the abuse of certain substances such as drugs and alcohol and of excessive food intake (e.g., the effects of excessive sugar, fat, and vitamins) – changing perspectives about nutrient requirements (e.g., the calcium requirements for women to prevent osteoporosis)

Objectives	Content: Selected Issues
	– the incidence of eating disorders and nutrition-related illnesses and diseases in Canada – an overview of recommended diets and the reasons for their success – the physiological effects of stress and the nutrients required as a result of stress – a nutritional analysis of various cuisines in the world
c) explore the relationship between nutrition, lifestyle, health, and disease from the perspective of the technological sciences.	– food processing methods that ensure that food retains its nutritional value either in its raw state or in the canning, drying, or freezing process (e.g., refrigeration, rapid transportation, appropriate storage procedures) – food production methods that provide physiological benefits (e.g., fluoridation of water, addition of vitamin D to milk) – a historical overview of the development and improvement of the equipment and utensils used in food production (e.g., the removal of equipment made with lead and the resulting reduction in metal contamination of food)

UNIT 3
FOOD SUPPLY AND SAFETY

The intent of this unit is to help students investigate the factors that have an impact on the production and availability of safe food in Canada.

Objectives	Content: Selected Issues
Students will be provided with opportunities to:	
a) investigate the factors that have an impact on the production and availability of safe food from the perspective of the social sciences;	– the significance for Canadians of a safe food supply – an overview of the evolution of government regulations on food safety – the purpose of the provincial Health Protection and Promotion Act and the federal Food and Drugs Act – the social, economic, and political factors underlying the use of pesticides and other compounds in food production – the growth in consumer awareness of the importance of safe food and the resulting changes in the market place (e.g., restaurant menus that indicate their use of organically-grown food)
b) investigate the factors that have an impact on the production and availability of safe food from the perspective of the biological sciences;	– the purposes of food additives and their effect on physiological well-being – the biochemical risks of food resulting from the use of contaminants such as pesticides, chemical fertilizers, hormones in animal feed, and water pollutants – various types of food poisoning, including botulism, salmonellosis, and staphylococcemia and their physiological effects – methods used in food production to prevent food poisoning – the role of yeast, molds, and bacteria in the supply and preservation of food – the effects on health of changes in the food supply (e.g., changes in the composition of nutrients and contaminants)

Objectives	Content: Selected Issues
c) investigate the factors that have an impact on the production and availability of safe food from the perspective of the technological sciences.	– problems encountered in eliminating food and water pollution, nationally and locally, and ways to overcome them – the importance of improved sanitary practices in the development of better health among Canadians – the quality of various food products in relation to different methods of production and supply (e.g., transportation of perishable food over great distances, organic versus non-organic food production) – methods and practices used to ensure safe food storage and handling in the home (e.g., short- and long- term storage of food, manner of keeping food equipment hygienic, storage and disposal of garbage)

UNIT 4

TRENDS IN FOOD AND NUTRITION SCIENCES

The intent of this unit is to enable students to examine current developments and future trends in food and nutrition sciences.

Objectives	**Content: Selected Issues**
Students will be provided with opportunities to:	
a) examine current developments and future trends in food and nutrition from the perspective of the social sciences;	– an analysis of consumer values, attitudes, and demands that will have an impact on future food products (e.g., environmental pollution concerns versus non-biodegradable food packaging) – the impact of immigration on eating patterns – the effect on eating patterns of new information on nutrition and well-being (e.g., current research on the relationship between nutrition and disease)
b) examine current developments and future trends in food and nutrition from the perspective of the biological sciences;	– an overview of representative current research in the field of nutrition (e.g., research on cholesterol) – the dietary implications of current nutritional research on growth, development, health, and disease prevention (e.g., omega-3 fatty acids)
c) examine current developments and future trends in food and nutrition from the perspective of the technological sciences.	– recent developments in food production (e.g., synthetic foods and analogues) – an overview of the technology currently used to increase nutrient retention in canned, frozen, dried, and smoked food products – trends in agribusiness and aquaculture in Canada – analysis of computer programs for personal food management

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